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PRESENT POST

Professor, Division of Earth and Ocean Science, Nicholas School of the Environment and Earth Sciences, Duke University, coastal processes and geomorphology

PROFESSIONAL EXPERIENCE

2005-2008 Associate Professor, Division of Earth and Ocean Science, Nicholas School of the Environment and Earth Sciences, Duke University
coastal processes and geomorphology

1998-2005 Assistant Professor, Division of Earth and Ocean Science, Nicholas School of the Environment and Earth Sciences, Duke University
coastal processes and geomorphology

1996-98 Postdoctoral Associate, Institute of Geophysics and Planetary Physics, Scripps Institution of Oceanography, University of California, San Diego
modeling and field study of broken wave and swash interactions and motions; modeling and field study of large-scale flow in the surf zone; modeling near-shore sediment transport; modeling and field study of periglacial processes and patterned ground; development and application of model-evaluation techniques. In collaboration with Dr. Brad Werner.

1995-96 Postdoctoral Associate, Geology and Geophysics, University of Minnesota
modeling of braided streams and alluvial fans; analysis of the spatial patterns of braided streams, subaqueous and eolian bedforms; testing models of braided streams and bedforms; field studies of braided streams. In collaboration with Dr. Chris Paola.

1994-95 *Research Associate*, Geology and Geophysics, University of Minnesota
braided-stream modeling; dynamical-systems analysis of the spatial patterns of braided streams; development of techniques for comparing models to real systems. Lectures presented in the course Geodynamics and the Geofluids seminar.

1993-94 *Doctoral Dissertation Fellow,* University of Minnesota
field studies of braided streams and eolian bedforms; laboratory studies of braided streams and subaqueous bedforms; analysis of braided stream and bedform data.

1992 *Research Associate,* Institute of Hydraulics, University of Genoa
assisted with the construction of a braided-stream flume; performed model braided stream experiment and collected data; presented lectures on dynamical systems.

1988-93 *Teaching Assistant*, Geology and Geophysics, University of Minnesota
Introductory Geology, Earth History, Honors Earth Science, Petrology, collection curator, tutor, assistant on field trips.

1986-88 *Teaching Assistant*, Physics, University of Minnesota

General Physics, Meteorology

EDUCATIONAL BACKGROUND

1995 **Ph.D., Geology, University of Minnesota**
Major Areas of Coursework: dynamical-systems mathematics, sediment transport, fluid mechanics, geomorpholgy
Dissertation: Braided-Stream Modeling and Model evaluation; dynamical-systems approaches
Supervisor: Dr. Chris Paola

1990 **Master of Science, Physics, University of Minnesota**
Major area of coursework: modern physics, philosophy of science
Thesis Paper: Interpretation of Quantum Mechanics
Supervisor: Dr. Roger Jones

1986 **Bachelor of Arts, Individualized Studies--General Science, University of Minnesota**
Honors Thesis: The Geology and Geomorphology of the Northwest Territories

1986 **Bachelor of Arts, Journalism, University of Minnesota**
Concentration: science writing

Training Courses

1987 Field Camp, Geology and Geophysics, University of Minnesota
mapping and field observation
1988-94 11 field courses with trips to many parts of North America, concentrating on geomorphology and surface processes

SYNERGISTIC ACTIVITIES

2017 - Steering Committee Chair, Community Surface Dynamics Modeling System (CSDMS)
2016 Participated in international iCOASST (UK national coastal research project) final workshop (London; presenter and panel member)
2015-2016 Co-organized Conference on Mathematical Geophysics, Paris, June 2016
2013- Co-organized workshop on Landscape response to Climate and Land-Use change; co-lead author on resulting synthesis paper
2013 Contributed to international iCOASST workshop (UK national coastal research project), coauthor on associated state-of-the-science journal articles
2011- Advisory Board, International organizing committee, Scientific Committee, International Symposium on River, Coastal and Estuarine Morphodynamics

2008-2011	Vice Chair, Nonlinear Geophysics Focus Group, American Geophysical Union
2008-	Executive Committee, Nonlinear Geophysics Focus Group, American Geophysical Union
2008	Lead author, white paper for NRC committee on Earth Surface Processes
2007- 2017	Chair, Coastal Working Group and Coastal Vulnerability Initiative, Community Surface Dynamics Modeling System (CSDMS)
2007	Organized an NSF-funded workshop on the future of Earth-surface science
2007	Co-organized Binghamton Symposium on 'Complexity in Geomorphology'
2007	Co-edited special issue of Geomorphology (devoted to complexity)
2005-2009	Associate Editor, Journal of Geophysics—Earth Surface
2005-	Scientific Committee, International Symposium on River, Coastal and Estuarine Morphodynamics
2005	American Geophysical Fall Meeting Program Committee member
2004	NSF workshop to develop the Community Surface Dynamics Modeling System
2002	NSF workshop to organize the Community Surface Dynamics Modeling System
2000	NSF workshop to develop the Source To Sink initiative
1999	NSF workshop to organize the Source To Sink initiative

FELLOWSHIPS AND HONORS

2016	William Morris Davis Lecturer, Boston universities (including: Boston College, MIT, Harvard, Woods Hole Oceanographic Institution, and Boston University)
2008	Most Cited Paper award (2003-2007), Continental Shelf Research
2007	Keynote presentation and paper, 5th International Symposium on River, Coastal and Estuarine Morphodynamics
1993	Doctoral Dissertation Fellow, Graduate School, University of Minnesota
1993	Geofluids Fellowship, Geology and Geophysics, University of Minnesota
1991	John W. Gruner Fellowship, Geology and Geophysics, University of Minnesota
1990	John W. Gruner Fellowship, Geology and Geophysics, University of Minnesota
1988	Departmental Fellowship, Geology and Geophysics, University of Minnesota
1986	Summa Cum Laude, University of Minnesota
1986	Phi Beta Kappa
1985	Honors Waller Scholarship, College of Liberal Arts, University of Minnesota

PUBLICATIONS

Edited Books

Barrier dynamics and response to changing climate. (2018) Moore, L. J., and Murray, A. B., eds. Springer, New York. 10.1007/978-3-319-68086-6.

Complexity in Geomorphology (2007) Murray, A. B., and Fonstad, M. A., eds. Published as a special issue of Geomorphology, vol. 91, 10.1016/j.geomorph.2007.07.011.

Book Chapters

Murray, A. B., and Moore, L. J., (2018) Geometric constraints on long-term barrier migration: from simple to surprising. In: Moore LJ, Murray AB (eds) Barrier dynamics and response to changing climate. Springer, New York. https://doi.org/10.1007/978-3-319-68086-6_7.

Moore L. J., Goldstein E. B., Vinent O. D., Walters D., Kirwan M., Lauzon R., Murray A. B., Ruggiero P. (2018) The role of ecomorphodynamic feedbacks and landscape couplings in influencing the response of barriers to changing climate. In: Moore LJ, Murray AB (eds) Barrier dynamics and response to changing climate. Springer, New York. https://doi.org/10.1007/978-3-319-68086-6_10.

Smith, M. D., Murray, A. B., Gopalakrishnan, S., Keeler, A. G., Landry, C. E., McNamara, D., and Moore, L. J., 2015, Chapter 7 – Geoengineering Coastlines? From Accidental to Intentional, in *Coastal Zones, Solutions for the 21st Century*, Elsevier, doi: 10.1016/B978-0-12-802748-6.00007-3

Murray, A. B., 2013, Which Models are Good (Enough), and When? Chapter 2 in: *Treatise on Geomorphology* (Editor-in-Chief: JF Shroder), Elsevier-Academic Press, Oxford; ISBN 0123747392

Murray, A.B., 2007, Two paradigms in landscape dynamics: Self-similar processes and emergence, Chapter 2 in: *Nonlinear Dynamics in Geophysics*, Tsonis, A. A.; Elsner, J. B. (Eds.), Springer, 604 p., ISBN: 978-0-387-34917-6

Murray, A.B., 2003, Contrasting the goal, strategies, and predictions associated with simplified numerical models and detailed simulations, in *Prediction in Geomorphology,* Dick Iverson and Peter Wilcock Eds, Geophysical Monograph 135, American Geophysical Union, 151-165.

Journal Articles

Reeves, I. R. B., Moore, L. J., Goldstein, E. B., Murray, A. B., Carr, J. A., and Kirwan, M. L., Impacts of seagrass dynamics on the coupled long-term evolution of barrier-marsh systems, Journal of Geophysics—Biogeosciences, revised and in re-review.

Yousefi Lalimi, F., Marani, M., Heffernan, J. B., D'Alpaos, A., and Murray, A. B., Watershed and estuarine controls on salt marsh extent and resilience, Earth Surface Processes and Landforms, revised, in re-review.

Lauzon, R., Murray, A. B., Cheng, S., Liu, J. Ells, D. D., and Lazarus, E. D., Correlation between shoreline change and planform curvature on wave-

dominated, sandy coastlines, Jour. of Geophys Res.—Earth Surface, accepted.

Montano, J., Coco, G., Antolinez, A. A., Beuzen, T., Bryan, K. R., Cagiagal, L., Castelle, B., Davidson, M., Goldstein, E. B., Ibaceta, R., Idier, D., Ludka, B., MasoudAnsari, S., Mendex, F. Murray. A. B., Plant, N. G., Ratliff, K., Robinet, A., Rueda, A. Senechal, A. Simmons, J. Splinter, K., Stephens, S. Townend, I., Vitousek, S., Shorecast: A novel approach to testing of shoreline models, Geophys. Res. Lett., in review.

Ratliff, K. M., Hutton, E. H. W., and Murray, A. B., Modeling long-term delta dynamics leads to new insights about river avulsion locations, Geology, in review.

Dong, X., Murray, A. B., Heffernan, J. B., 2018, Ecohydrologic feedbacks controlling sizes of cypress wetlands in a patterned karst landscape, Earth Surface Processes and Landscapes, https://doi.org/10.1002/esp.4564.

Antolinez, J. A. A., Murray, A. B., Mendez, F. J., Moore, L. J., Farley, G., and Wood, J., 2018, Downscaling changing coastlines in a changing climate, the hybrid approach, Journal of Geophysical Research: Earth Surface, 123. *https://doi.org/10.1002/2017JF004367*.

Lauzon, R., and Murray, A. B., 2018, Comparing the cohesive effects of mud and vegetation on delta evolution, Geophysical Research Letters, 45. https://doi.org/10.1029/2018GL079405.

Lauzon, R., Moore, L. J., Murray, A. B., Walters, D. C., Kirwan, M. L., and Fagherazzi, S., 2018, Effects of marsh edge erosion in coupled barrier island-marsh systems and geometric constraints on marsh evolution, accepted pending revision, Journal of Geophysical Research-Earth Surface. https://doi.org/10.1029/2017JF004530

Ratliff, K. M., Hutton, E. H. W., and Murray, A. B., 2018, Exploring wave and sea-level rise effects on delta morphodynamics with a coupled river-ocean model, Journal of Geophysical Research—Earth Surface, 123, https://doi.org/10.1029/2018JF004757.

Chamberlin, C. A., Bianchi, T. S., Brown, A. L., Cohen, M. J., Dong, X., Flint, M. K., Martin, J. B., McLaughlin, D. L., Murray, A. B., Pain, A., Quintero, C. J., Ward, N. D., Zhang, X., Heffernan, J. B., 2018, Mass balance implies Holocene development of a low-relief karst patterned landscape, Chemical Geology, https://doi.org/10.1016/j.chemgeo.2018.05.029.

Dong, X., Cohen, M. J., Martin, J. B., McLaughlin, D. L., Murray, A. B., Ward, N. D., Flint, M. K., Heffernan, J. B., 2018, Ecohydrologic processes and soil thickness feedbacks control limestone-weathering rates in a karst landscape, Chemical Geology, https://doi.org/10.1016/j.chemgeo.2018.05.021.

Limber, P.W., Adams, P.N. and Murray, A.B., 2017. Modeling large-scale shoreline change caused by complex bathymetry in low-angle wave climates. Marine Geology, http://dx.doi.org/10.1016/j.margeo.2016.11.006

Thomas, C. W., Murray, A. B., Ashton, A. D., Hurst, M. D., Barkwith, A. K. A. P., and Ellis, M. A., 2016, Complex coastlines responding to climate change: do shoreline shapes reflect present forcing or "remember" the distant past?, Earth Surf. Dynam., 4, 871-884, doi:10.5194/esurf-4-871-2016.

Murray, A.B., Gasparini, N.M., Goldstein, E.B., and van der Wegen, M., 2016, Uncertainty quantification in modeling earth surface processes: more applicable for some types of models than for others, Computers & Geosciences, 90, Part B, 6-16,doi.org/10.1016/j.cageo.2016.02.008.

Gopalakrishnan, S., McNamara, D., Smith, M. D., and Murray, A. B., 2016, Decentralized management hinders coastal climate adaptation: the spatial-dynamics of beach nourishment, Environmental Resource Economics, DOI 10.1007/s10640-016-0004-8.

Lazarus, E.D., Ellis, M.A., Murray, A.B., and Hall, D.M., 2016, An evolving research agenda for human–coastal systems, Geomorphology, 256, 81 – 90, http://dx.doi.org/10.1016/j.geomorph.2015.07.043.

French, J., Payo, A., Murray, A. B., Orford, J., Eliot, M., and Cowell, P., 2016, Appropriate complexity for the prediction of coastal and estuarine geomorphic behavior at decadal to centennial scales, Geomorphology, 256, 3 – 16, http://dx.doi.org/10.1016/j.geomorph.2015.10.005.

Van Maanen, B., Nicholls, R.J., French, J., Barkwith, A., Bonaldo, D., Burningham, H., Murray, A. B., Payo, A., Southerland, J., Thornhill, G., Townend, I.H., van der Wegen, M., Walkden, M.J.A., 2016, Simulating mesoscale coastal evolution for decadal coastal management: A new framework integrating multiple, complementary modeling approaches, Geomorphology, 256, 68 - 80, http://dx.doi.org/10.1016/j.geomorph.2015.10.026.

Brenner, O. T., Moore, L.J, and Murray, A.B., 2015, The complex influences of back-barrier deposition, substrate slope and underlying stratigraphy in barrier island response to sea-level rise: Insights from the Virginia Barrier Islands, Mid-Atlantic Bight, U.S.A., Geomorphology, 246, 334-350, http://dx.doi.org/10.1016/j.geomorph.2015.06.014.

Hurst, M. D., A. Barkwith, M. A. Ellis, C. W. Thomas, *and* A. B. Murray. 2015, Exploring the sensitivities of crenulate bay shorelines to wave climates using a new vector-based one-line model, J. Geophys. Res. Earth Surf., 120, 2586–2608, *doi:*10.1002/2015JF003704

Pelletier, J. D., Brad Murray, A., Pierce, J. L., Bierman, P. R., Breshears, D. D., Crosby, B. T., Ellis, M., Foufoula-Georgiou, E., Heimsath, A. M., Houser, C., Lancaster, N., Marani, M., Merritts, D. J., Moore, L. J., Pederson, J. L., Poulos, M. J., Rittenour, T. M., Rowland, J. C., Ruggiero, P., Ward, D. J., Wickert, A. D. and Yager, E. M., 2015, Forecasting the response of Earth's surface to future climatic and land use changes: A review of methods and research needs. Earth's Future, 3: 220–251. doi:10.1002/2014EF000290.

Limber, P. W. and Murray, A. B., 2015, Sea stack formation and the role of abrasion on beach-mantled headlands. Earth Surf. Process. Landforms, 40: 559–568. *doi:* 10.1002/esp.3667.

Johnson, J.M, L.J. Moore, K. Ells, A.B. Murray, P.N. Adams, R.A. MacKenzie III, and J.M. Jaeger, 2015, Recent Shifts in Coastline Change and Shoreline Stabilization Linked to Storm Climate Change, Earth Surface Processes and Landforms. DOI: 10.1002/esp.3650

Murray, A.B., Coco, G., and Goldstein, E.B., 2014, Cause and Effect in Geomorphic Systems: Complex-Systems Perspectives, Geomorphology, 214, 1 – 9. DOI: 10.1016/j.geomorph.2014.03.001.

Murray, A.B., E. B. Goldstein, and G. Coco, 2014, The shape of patterns to come: from initial formation to long-term evolution, Earth Surface Processes and Landforms, 39, 62 – 70, DOI: 10.1002/esp.3487.

Ratliff, K. M., and A. B. Murray, 2014, Modes and emergent time scales of embayed beach dynamics, Geophysical Research Letters, 41, 7270 – 7275, DOI: 10.1002/2014GL061680.

Limber, P., A.B. Murray, Goldstein, E.B., and Adams, P., 2014, Unraveling the dynamics that scale cross-shore headland relief on rocky coastlines, Part 1: Model development J Geophys Res—Earth Surface 119, 854–873, doi:10.1002/2013JF002950.

Limber, P., and A.B. Murray, 2014, Unraveling the dynamics that scale cross-shore headland relief on rocky coastlines, Part 2: Model predictions and initial tests, J Geophys Res—Earth Surface, 119, 874–891. doi:10.1002/2013JF002978.

Barkwith, A., C. W. Thomas, P. W. Limber, M. A. Ellis, and A. B. Murray, 2014, Assessing the vulnerability of a pinned, soft-cliff coastline – Part I: Assessing the natural sensitivity to wave climate, Earth Surface Dynamics (ESurf), 2, 295 – 308. doi:10.5194/esurf-2-295-2014.

Barkwith, A., C. W. Thomas, P. W. Limber, M. A. Ellis, and A. B. Murray, 2014 Assessing the vulnerability of a pinned, soft-cliff coastline – Part II: Assessing the influence of seawalls on future morphology, Earth Surface Dynamics 2, 233 – 242, doi: 10.5194/esurf-2-233-2014.

Goldstein, E.B., Coco, G., and A.B. Murray, 2014, Data driven components in a model of inner shelf sorted bedforms: a new 'hybrid' model, Earth Surface Dynamics (ESurf), 2 67 – 82. doi:10.5194/esurf-2-67-2014.

Murray, A. B., and Ashton, A. D., 2013, Instability and finite-amplitude self organization of large-scale coastline shapes, Philosophical Transactions of the Royal Society of London A Math Phys Eng Sci, vol. 371:2004, pp. 20120363.

Worman, S., Murray, A. B., Littlewood, R., Andreotti, B., and Claudin, P., 2013, Modeling emergent large-scale structures of barchans dune fields, Geology, 41, 1059 – 1062.

Goldstein, E. B., G. Coco, and A.B. Murray, 2013, Prediction of Wave Ripple Characteristics using Genetic Programming, Continental Shelf Research, 71, 1 – 15,

Moore, L. J., McNamara, D. E., Brenner, O., and Murray, A.B., 2013, Observed changes in hurricane-driven waves explain the dynamics of modern cuspate shorelines, Geophys. Research Lett., 40, 5867–5871, doi:10.1002/2013GL057311.

Williams, Z. C., McNamara, D. E., Smith, M. D., Murray, A. B., and Gopalakrishnan, S., 2013, Coupled Economic-Coastline Modeling with Suckers and Free Riders, J. Geophysical Research, 118, 887-899, DOI: 10.1002/jgrf.20066.

Murray, A.B., S. Gopalakrishnan, D. E. McNamara, and M. D. Smith, 2013, Progress in Coupling Models of Human and Coastal Landscape Change, Computers and Geosciences, 53, 30-38, 10.1016/j.cageo.2011.10.010

Ells, K., and Murray, A.B., 2012, Long-term, non-local coastline responses to local shoreline stabilization, Geophys. Research Letters, 39, L19401, doi:10.1029/2012GL052627

Lazarus, E., Ashton, A., and Murray, A.B., Large-scale patterns in hurricane-driven shoreline change, in Extreme Events and Natural Hazards: The Complexity Perspective, (A.S. Sharma, V.P. Dimri, and A. Bunde Eds), Geophysical Monograph Series 196, American Geophysical Union, 10.1029/2011GM001074.

Riley, P. Murray, A.B., and Tikoff, B. (2012) Geometric scale invariance, genesis, and self-organization of polygonal fracture networks in granitic rocks. Journal of Structural Geology, v. 42, p. 34-48

Kirwan, M. L., and Murray, A. B., 2012, Rapid wetland expansion during European settlement and its implication for marsh survival under modern sediment delivery rates: REPLY, Geology, 40, p. e4286, doi: 10.1130/G33827Y.1

Goldstein, E., Murray, A.B., and Coco, G., 2011, Sorted bedform pattern evolution: Persistence, destruction and self-organized intermittency, Geophys. Research Letters, 38, L24402, doi:10.1029/2011GL049732

Lazarus, E. D., McNamara, D. E., Smith, M. D, Gopalakrishnan, S., and Murray, A. B. , 2011, Emergent behavior in a coupled economic and coastline model for beach nourishment, Nonlinear Processes in Geophysics, 18, 989-999, doi:10.5194/npg-18-989-2011

Limber, P.W., and Murray, A.B., 2011. Beach and sea cliff dynamics as a driver of rocky coastline evolution and stability. GEOLOGY, 39, 1147-1150, doi: 10.1130/G32315.1.

McNamara, D., Murray, A.B., and Smith, M.D., 2011, Coastal sustainability depends on how economic and coastline responses to climate change affect each other, Geophysical Research Letters, 38, L074, doi: 10.1029/2011GL047207.

Riley, P., Tikoff, B., and Murray, A.B., Quantification of fracture networks in non-layered, massive rock using synthetic and natural data sets, Tectonophysics, 505, 44-56, . http://dx.doi.org/10.1016/j.tecto.2011.04.002

Kirwan, M., Murray, A.B., Donnely, J., and Corbett, R., ,2011, Rapid wetland expansion during European settlement and its implication for marsh survival under modern sediment delivery rates, Geology, 39, p. 507–510; doi:10.1130/G31789.1

Lazarus, E., Murray, A.B., 2011, An integrated hypothesis for regional patterns of shoreline change along the Northern North Carolina Outer Banks, USA, Marine Geology, 281, 85-90, doi.org/10.1016/j.margeo.2011.02.002.

Lazarus, E., Ashton, A., and Murray, A.B., 2011, Cumulative versus transient shoreline change: Dependencies on temporal and spatial scale, J. Geophysical Research, 116, F022014, doi:10.1029/2010JF001835.

Magliocca, N. R., McNamara, D., Murray, A.B., 2011, Long-term, large-scale effects of artificial dune construction along a barrier island coastline, Journal of Coastal Research, 27, 918-930.

Gopalakrishnan. S, Smith. M, Slott. J and Murray, A.B, 2010, The Value of Disappearing Beaches in North Carolina: A hedonic pricing model with endogenous beach width, Journal of Environmental Economics and Management, 61, 297-310, doi:10.1016/j.jeem.2010.09.003.

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Andreotti, B., Fourrière, A., Ould-Kaddour, F., Murray, A.B., and Claudin, P., 2009, Size of giant dunes limited by the depth of the atmospheric boundary layer, Nature 457, 1120-1123.

Wolinsky, M.A., and Murray, A.B., 2009, A unifying framework for shoreline migration: 2. Application to wave-dominated coasts, Journal of Geophysical Research—Earth Surface, 114, F01009, doi:10.1029/2007JF000856.

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Smith, M.D., Slott, J.M., McNamara, D., and Murray, A.B., 2009, Beach Nourishment as a Dynamic Capital Accumulation Problem, Journal of Environmental Economics and Management, 58, Issue 1, 58-71.

Kirwan, M., and Murray, A.B., 2008, Tidal marshes as disequilibrium landscapes? Lags between morphology and Holocene sea level change, Geophysical Research Letters, 35, L24401, doi:10.1029/2008GL036050.

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Slott, J.M., Smith, M.D., and Murray, A.B., 2008, Synergies Between Adjacent Beach-Nourishing Communities in a Morpho-economic Coupled Coastline Model, Journal of Coastal Management, 36,374 - 391.

Kirwan, M., and Murray, A.B., 2008, Temporary vegetation disturbance as an explanation for permanent loss of tidal wetlands, Geophysical Research Letters, v. 35, L05403, doi:10.1029/2007GL032681.

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Huntley, D. A., G. Coco, K. R. Bryan, and A. B. Murray, 2007, Influence of 'defects' on sorted bedform dynamics, Geophys. Res. Lett., doi:10.1029/2007GL030512.

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Valvo, L.M., Murray, A.B., Ashton, A., 2006, How Does Underlying Geology Affect Coastline Change? An Initial Modeling Investigation, Journal of Geophysical Research, Vol. 111, F02025, doi: 10.1029/2005JF00340

Ashton, A, and Murray, A.B., 2006, High-angle wave instability and emergent shoreline shapes: 1. Modeling of capes, flying spits and sandwaves, Journal of Geophysical Research, 111, F04011, doi:10.1029/2005JF000422.

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Conference Proceedings Contributions

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Syvitski, J.P.M., Slingerland, R.L., Burgess, P., Meiburg, E., Murray, A.B., Wiberg, P., Tucker, G., and A.A. Voinov, 2010, Morphodynamic Models: An Overview. In: Vionnet et al. (eds) River, Coastal and Estuarine Morphodynamics: RCEM 2009, Taylor& Francis Group, London, ISBN 978-415-55426-8 CR Press, p. 3-20.

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Kirwan, M., and Murray, A.B., 2005, Response of an ecomorphodynamic model of tidal marshes to varying sea level rise rate, 4th International symposium on River, Coastal, and Estuarine Morphodynamics, Champaign-Urbana, Oct. 2005.

Valvo, L., Murray, A.B., and Ashton, A., 2005, Investigating shoreface lithology effects in a process-based model of coastal change, Coastal Dynamics '05, in press.

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Murray, A.B., and Ashton, A., 2003, Sandy-coastline evolution as an example of pattern formation involving emergent structures and interactions, Coastal Sediments ’03.

Ashton, A., List, J.H., Murray, A.B., and Farris, A.S., and 2003, Investigating links between hotspots and alongshore sediment transport using field measurements and simulations, Coastal Sediments ’03.

Murray, A.B., Ashton, A., and Arnoult, O., 2001, Large-scale morphodynamic consequences of an instability in alongshore transport, Proceedings of the International Association for Hydraulic Research Symposium on River, Coastal and Estuarine Morphodynamics, Obihiro, Japan, Sepember 10-14, 355-364.

Murray, A.B., Ashton, A., and Arnoult, O., 2001, An instability in shoreline shape, and connections with eolian morphodynamics, Proceedings of the 2nd International Conference on Dune Formation and Migration, Nouachott, Mauritania, February 2001.

Murray, A.B., and Reydellet, G., 1999, Rip currents in the absence of bathymetric forcing, Proceedings of the International Association for Hydraulic Research Symposium on River, Coastal and Estuarine Morphodynamics, Genoa, Sepember 6-10, V. 1, 405-414.

Miscellaneous Publications

Ashton, A, and Murray, A.B., 2010, Self-organization of shorelines and water bodies by breaking wave processes, 2010 Yearbook of Science & Technology, McGraw-Hill.

Murray, A.B., Lazarus, E., Ashton, A., Baas, A., Coco, G., Coulthard, T., Fonstad, M., Haff, P.K., McNamara, D., Paola, C., Reinhardt, L., Geomorphology, complexity, and the emerging science of the Earth's surface, White Paper contributed to the NRC Committee on Opportunities in Earth Surface Processes Research.

Ashton, A, and Murray, A.B., 2008, Reply to a Comment to: High-angle wave instability and emergent shoreline shapes, Journal of Geophysical Research, 113, F01006, doi:10.1029/2007JF000885.

Elsner, J. B., Gupta, V. K., Lovejoy, S., Lucarini, V., Murray, A. B., Sharma, A. S., Tebbens, S., Tsonis, A. A., Vassiliadis, D., 2007, Meeting summary: 20 Years of Nonlinear Dynamics in Geosciences, EOS, Transactions 88 (3), 29.

Pratson, L., Wiberg, P., Steckler, M., Cacchione, D., Karson, J., Mullenbach, E., Swenson, J., Nittrouer, C., Murray, A.B., Spinelli, G., Fulthorpe, C., O'Grady, D., Parker, G., Driscoll, N., Burger, R., Paola, C., Orange, D., Wolinsky, M., Field, Ml, Fredrichs, C., Fidelez, J., Seascape evolution on clastic ontinental shelves and slopes, in Nittrouer, C., et al. eds., Strataform Master Volume.

Murray, A.B., 2004, Book Review: "Coasts: form, process and evolution," by Colin D. Woodroffe, in Bulletin of the American Meteorological Society, September 2004, 1389.

Ashton, A. and Murray, A.B., 2004, Discussion on "On the development of large-scale cuspate features on a semi-reflective beach: Carchuna beach, southern Spain," Marine Geology, 206, 283-284.

Murray, A.B., 2002, Opinion Article: Seeking explanation affects numerical-modeling strategies, EOS Transactions 83, 418-419.

Murray, A.B., 2002, Opinion Article: Response to "Numerical modeling strategies revisited," (a comment on "Seeking explanation affects numerical-modeling strategies"), EOS Transactions 84, 100.

Murray, A.B., 2001, Book Review: "Coastal Geomorphology," By Eric Bird, in EOS Transactions, 82, 349.

GRADUATE STUDENTS SUPERVISED

Rebecca Lauzon (PhD program) Coastal marsh morphology and biogeochemistry

Katherine Murray (Ph.D. candidate) Sediment dynamics and human influences on rocky coastlines.

Stacey Worman (Ph.D. 2015) Dynamics of sand dune fields.

Evan Goldstein (Ph.D. 2014) Seabed sediment dynamics and pattern formation.

Kenneth Ells (Ph.D. 2014) Human-landscape coupling on sandy coastlines.

Patrick Limber (Ph.D. 2013) Large-scale, long-term evolution of rocky coastlines.

Eli Lazarus (Ph.D. 2011) Testing theoretical and numerical model predictions of shoreline change using LIDAR data.

Ryan Littlewood (MS 2008) Shoreline dynamics and barchan-dune-field evolution.

Jordan Slott (Ph.D. 2008) Interactions between coastline evolution, large-scale human manipulations, and of sea-level rise.

Matt Kirwan (Ph.D. 2007) Coastal marsh ecomorphodynamics: long-term development, and responses to changing land uses and sea-level-rise rates

Mark Strudley (Ph.D. 2006, co-supervised with Peter Haff) Arid regions landscape dynamics.

Andrew Ashton (Ph.D. 2005) Analysis and modeling of large-scale shoreline features, including capes and cuspate forelands.

Lisa Valvo (MS 2005) Effects of heterogeneous lithology on coastline dyanamics.

Fabien Guillemot (Visiting Scholar at Duke University, from Ecole Normale Superieure, Paris) Modeling sediment sorting on the nearshore seabed: the self-organization of "rippled scour depressions" from simple feedbacks.

Olivier Arnoult (Visiting Scholar at Duke University, from Ecole Normale Superieure, Paris) Modeling instabilities in alongshore sediment transport and shoreline planforms.

Cyril Guillon (Visiting Scholar at Duke University, from Ecole Normale Superieure, Paris) Refinement and testing of a nearshore circulation and morphodynamic model.

Michael LeBars (Visiting Scholar at the University of California, San Diego, from Ecole Normale Superieure, Paris) Comparing field measurements to the predictions of a rip current model.

Guillaume Reydellet (Visiting Scholar at the University of California, San Diego, from Ecole Normale Superieure, Paris) Modeling the origins and dynamics of rip currents.

Mark Kessler (informally co-supervised at the University of California, San Diego) Modeling arctic sorted patterned ground.

Graduate-student Committees

Michael Kinsela, University of Sydney, Shoreface evolution

David Walters, University of North Carolina-Chapel Hill, Barrier-island/marsh interactions.

Stephan Gary, PhD program, Duke University; Atlantic thermohaline circulation.

Tommy Gerber, PhD 2008, Duke University; Turbidity current depositional dynamics.

Matt Wolinsky, PhD 2005, Duke University; Process and form in Earth-surface dynamics.

Matt Stutz, PhD, 2004, Duke University; A global study of Barrier Islands.

Joseph van Gaalen, MS, 2004, University of South Florida; Synthesis of large-scale coastal sediment transport patterns.

Jessica Thompson, MS, 2001, Duke University, Assessment of a Simple Stochastic Model for Prediction of Mass Transport in Groundwater.

Lesley Glass, MS, 2000, Duke University, Indexing Gully Discharge Deficit to Modifications of Interfluve Properties on Desert Pavement Fans and Implications for Gully Vegetation, Sonoran Desert, Arizona.

Jun-Yong Park, PhD, 2000, University of North Carolina; Littoral processes on the Cape Lookout cuspate foreland.

Lonny Boring, MS, 1999, Duke University; An empirical model of large scale sediment transport in arid terrain.

PROFESSIONAL SOCIETIES

Geological Society of America, American Geophysical Union, European Geosciences Union

RECENT GRANT ACTIVITY

Title: *Collaborative Research; Environment, Society, and Economy: Modeling New Behaviors Emerging from Coupling Physical Coastal Processes and Coastal Economies*

Source: NSF Geomorphology and Land Use Dynamics (and ESE, Ecosystems)

Location: Duke University

Amount: $ 460,036 07/01/10 – 06/31/13

Current Support 0.67 mo/yr (summer)

Title: *Collaborative Research: Coastal Geomorphic Consequences of Wave Climate Change*

Source: *NSF EAR (Geomorphology and Land Use Dynamics)*

Location: Duke University

Amount: $ 37,748 09/15/11 – 09/14/14

Current Support 0.25 mo/yr (summer)

Title: *Collaborative Research: Sea level rise and vegetation controls on deltaic landform evolution: A coupled experimental and numerical modeling study*

Source: *NSF EAR (Geomorphology and Land Use Dynamics)*

Location: Duke University

Amount: $ 212,843 09/01/13 – 08/31/16

Current Support 0.4 mo/yr (summer)

Title: Collaborative Research: The Ecological Drill Hypothesis: Biotic Control on Carbonate Dissolution in a Low-Relief Patterned Landscapes

Source: *NSF DEB (Ecosystems)*

Location: Duke University

Amount: $229,911 (co-PI with Jim Heffernan) 5/1/14 - 4/30/17

Awarded 0.5 mo/yr (summer)

Title: Collaborative Research: Watersheds, Land-Use History, and Estuarine Morphology as Drivers of Coastal Wetland Extent, Age, and Resilience

Source: *NSF EAR (Geomorphology and Land Use Dynamics)*

Location: Duke University

Amount: $529,825 (co-PI with Jim Heffernan) 8/1/2014 - 4/31/2017

Pending 0.5 mo/yr (summer)

Title: Collaborative Research: Climate change adaptation in a coupled geomorphic-economic coastal system with heterogeneous climate beliefs

Source: NSF Coastal SEES

Location: Duke University

Amount: $ 738,574 (co-PI with Marty Smith) 08/01/14 – 07/31/18

Pending (to be submitted 1/21/14) 0.75 mo/yr (summer)

Title: Initial Modeling of Rocky Coastline Evolution

Source: NSF Geomorphology and Land Use Dynamics

Location: Duke University

Amount: $144,913 07/01/10 – 06/30/12

0.5 mo/yr (summer)

Title: Sorted Bedform Dynamics and Stratigraphic Architecture

Source: ExxonMobile

Location: Duke University

Amount: $75,000 01/01/10 – 12/31/10

2 mo/yr (summer)

Title: Collaborative Research: Coasts in Motion: Quantifying the patterns of coastal change using LIDAR

Source: NSF Geology and Paleontology

Location: Duke University

Amount: $107,062 04/01/05 – 03/31/08

0.25 mo/yr (summer)

Title: Coupling Human and Natural Influences on Coastline Evolution as Climate Changes

Source: NSF Biocomplexity in the Environment, CNH

Location: Duke University

Amount: $1,199,620 10/01/05 – 09/30/10

2.0 mo/yr (summer)

Title: Collaborative Research: Observations and Modeling of Inner-Shelf Sediment Dynamics and Large-Scale Sorting: Cross-Shelf or Alongshelf Transport?

Source: NSF Marine Geology and Geophysics

Location: Duke University

Amount: $152,760 08/13/2004 – 12/31/2007

0.5 mo/yr (summer)

Title: Productivity, stability and geomorphological evolution of New England salt marshes; Plum Island case study

Source: NSF Geomorphology and Land Use Dynamics

Location: Duke University

Amount: $120,685 07/01/05 – 06/01/08

0.25 mo year1, 0.15 mo year 2 (summer)

Title: Complexity in Geomorphology Symposium: Binghamton 2007

Source: NSF Geomorphology and Land Use Dynamics

Location: Duke University

Amount: $30,644 07/01/07 – 6/30/08

No Salary

Title: Quantifying the role of alongshore sediment-transport processes in regional patterns of shoreline change

Source: US Geological Survey and US Army Corps of Engineers

Location: Duke University

Amount: $41,140 09/01/06 – 8/31/07

No Salary